

TITLE OF THE INVENTION

DATA DISTRIBUTION NETWORK AND METHOD OF USE

CROSS-REFERENCE TO RELATED APPLICATIONS

5 [0001] This application is a continuation of U.S. Application Number 09/481,778,
filed January 11, 2000, which is a continuation-in-part of U.S. Application Number 09/241,937,
filed February 2, 1999, now issued as patent number 6,347,301. The disclosures of these
applications are expressly and fully incorporated herein.

10 FIELD OF THE INVENTION

 [0002] This invention relates generally to data distribution networks, and more
particularly to a data distribution network that distributes real-time data directly to consumers via
data distribution nodes installed in locations accessible to the consumer when the data is
required.

15 BACKGROUND

 [0003] The following art defines the present state of this field: Newell, U.S.
4,387,296, discloses a portable computer for use in the utility industry. A user reads the numeric
information on the utility meter, enters the data into the computer, and is then able to manipulate
20 the data associated with that account, including calculating the customer's bill. Blum, U.S.
4,628,193, discloses a hand-held electronic apparatus that contains a database of information
about a plurality of workers. The user inputs an alphanumeric identifier, such as the worker's

identity, and is able to access data about that person, specifically, what assignment that worker should receive.

[0004] Many similar references disclose handheld computers being used to access databases of information about persons and inventories in response to either alphanumeric or machine-readable indicia. O'Hagan, U.S. 5,821,512, and Overman, U.S. 5,483,472, disclose shopping cart or hand-held portable computers for retrieving information about products while shopping. Nishiyama, U.S. 5,721,942, discloses a personal information display system for serving large capacities of general information to user-designated stations at user-designated times. Smith, U.S. 5,455,409, discloses an apparatus for monitoring a plurality of coded articles and for identifying the location of selected items. Ray, U.S. 5,380,994, discloses a hand-held computer for inventory control. Koenck, U.S. 5,331,136, discloses a hand-held computer data-capture system. Sussman, U.S. 5,262,940, discloses a portable media tracking device.

[0005] It is also known to send data to a cellular phone, as discussed in The Economist, Special Telecommunications Supplement, October 9-15, 1999. This article discusses novel cellular phones that have many computer-like functions, such as maintaining your calendar and contact database. The article also discusses the novel cellular phones that send and receive data, including sports scores, stock data, biorhythms, and even dating services.

[0006] The prior art teaches the use of computer networks to disseminate data through an organization to achieve certain goals, such as inventory control. However, the prior art does not teach a centrally located computer that distributes a stream of constantly updated data to a plurality of data distribution nodes for periodic download to a plurality of hand-held computers, as taught by this invention. There is a long-felt need for people to be able to

download current consumer and travel data into a hand-held computer; and there is a long-felt need for people to be able to accomplish this download while in the process of either shopping or traveling. The prior art does not teach the distribution of hand-held computers to a plurality of consumers for download, while the consumer is shopping, of current purchasing information often required by a consumer. The prior art also does not teach the distribution of hand-held computers to a plurality of travelers for download, during the course of the traveler's trip, of current travel information often required by a traveler. The present invention fulfills these needs and provides further related advantages as described in the following summary.

SUMMARY OF THE INVENTION

[0007] The present invention teaches certain benefits in construction and use which give rise to the objectives described below.

[0008] The present invention provides a data distribution network for distributing data. The data distribution network stores up-to-date or even real-time data in a central computer and disseminates the data through a plurality of data distribution nodes to a plurality of hand-held computers. The data distribution network distributes current or real-time data to consumers and travelers directly to the location where the consumers and travelers are likely to require the data. In a preferred embodiment, such a data distribution network can function completely automatically, in real-time, and without any effort or expertise on the part of the consumer or traveler. Such a data distribution network enables several novel methods of attracting and retaining consumers to a specific commercial location and travelers to a specific hotel or travel agency.

[0009] A primary objective of the present invention is to provide a data distribution network having advantages not taught by the prior art.

[0010] Another objective is to provide a data distribution network that can deliver current information directly to consumers and travelers while they are in the process of either
5 purchasing goods or traveling away from home.

[0011] Another objective is to provide a data distribution network that can deliver data that is personalized to the individual user.

[0012] A further objective is to provide a data distribution network that provides hand-held computers that allow the user to carry the information with them for easy reference.

10 [0013] Other features and advantages of the present invention will become apparent from the following, more detailed description, taken in conjunction with the accompanying drawings, which illustrate, by way of example, the principles of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

15 [0014] The accompanying drawings illustrate the present invention. In such drawings:

[0015] FIGURE 1 is a block diagram of the present invention;

[0016] FIGURE 2 is a perspective view of the hand-held computer having an electrical contact connector;

[0017] FIGURE 3 is a perspective and partially exploded view of a data distribution node operably connected to a cash register and a credit card reader, the data distribution node having a docking station for receiving one of the plurality of hand-held computers;

5 [0018] FIGURE 4 is a perspective view of the hand-held computer showing a second embodiment of the hand-held data transfer mechanism, the hand-held data transfer mechanism, including a first transmitter/receiver that operates in cooperation with a second transmitter/receiver of the second embodiment of the data distribution node;

[0019] FIGURE 5 is a block diagram of the consumer shopping embodiment of
10 the invention;

[0020] FIGURE 6 is a flow diagram of showing the transmission of an electronic request from the hand-held computer to the central computer and the transmission of an electronic response back to the hand-held computer;

[0021] FIGURE 7 is a block diagram of a flight data system embodiment of the
15 present invention; and

[0022] FIGURE 8 is a block diagram of an electronic concierge system embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

20 [0023] The above-described drawing figures illustrate the invention, a data distribution network 10 for distributing data. The data distribution network 10 stores up-to-date

or real-time data in a central computer **20**, and disseminates the data through a plurality of data distribution nodes **30** to a plurality of hand-held computers **40**. The data distribution network **10** distributes current or even real-time data to consumers and travelers directly to the location where the consumers and travelers are likely to require the data. In a preferred embodiment, the data distribution network **10** can function completely automatically, in real-time, without any effort or expertise on the part of the consumer or traveler. The data distribution network **10** enables several novel methods, described below, of attracting and retaining consumers to a specific commercial location and travelers to a specific hotel or travel agency.

[0024] As shown in Fig. 1, the data distribution network **10** relies on the central computer **20** to store and maintain the data. The central computer **20** has a central microprocessor operably connected to a central means for storing the data **24**. In the preferred embodiment, central computer **20** is a server or personal computer having a CPU, RAM, ROM and a hard drive, all operably connected by a motherboard (not shown). The central computer **20** further has a means for updating the data **26**. Most of the data that is discussed herein is already maintained somewhere in an existing computer network; therefore, the data updating means **26** is preferably an operable connection to many other external computer networks with software necessary to transfer the current data into the central storing means of the central computer **20**. In alternative embodiments, the data updating means **26** is a keyboard and mouse, or some other well known data entry mechanism. Since computers, computer networks, data updating means **26**, and similar devices and systems are well known to those skilled in the art, they are not discussed at length herein.

[0025] As shown in Fig. 1, the data distribution network **10** uses the plurality of data distribution nodes **30** to transmit the data from the central computer **20** to the plurality of

hand-held computers **40**. Each of the plurality of hand-held computers **40** has a hand-held data transfer mechanism **42**, and a hand-held means for storing the data **44** operably connected to a hand-held microprocessor **46**. The hand-held data transfer mechanism **42** is discussed in more detail below. The hand-held means for storing the data **44** is preferably a memory chip operably
5 connected to a hand-held microprocessor **46**, both well known in the art. Each of the plurality of hand-held computers **40** further has a means for displaying **48** the data and a means for manipulating **49** the data. The means for displaying **48** the data is preferably an LCD screen electronically connected to the memory means through an LCD driver chip (not shown), although many equivalent displays are well known in the art. In a first embodiment, the data
10 manipulation means **49** is a keypad, either with an entire "qwerty" keyboard, or a reduced size keypad, designed to navigate a series of menus. In a second embodiment, the data manipulation means **49** is a microphone electronically connected to the hand-held computer **40**, the hand-held computer **40** having a means for converting sound (not shown) into computer commands.

[0026] The plurality of data distribution nodes **30** are operably connected to the
15 central computer **20**, preferably through a global communications network such as the Internet™ or an equivalent network. Establishing such a connection is well known to those skilled in the art. It is not essential that the operable connection maintain a constant flow of data -- the connection can be made temporarily on a periodic basis for the purpose of updating data. In its preferred embodiment, each of the plurality of data distribution nodes **30** is a computer having a
20 CPU, RAM, ROM and a hard drive, all operably connected by a motherboard as described above. By providing the data distribution node **30** with a hard drive, the data distribution node **30** is able to store data for retrieval, thereby eliminating the requirement of a permanent connection to the central computer **20**.

[0027] Each of the data distribution nodes **30** has a node data transfer mechanism **32** for transferring the data from the central computer **20** to the hand-held data transfer mechanism **42** of one of the hand-held computers **40** in response to a request from the hand-held data transfer mechanism **42**. The node data transfer mechanism **32** cooperates with the hand-held data transfer mechanism **42** to operably connect one of the data distribution nodes **30** to the hand-held computer **40** that is requesting data.

[0028] In a first embodiment, as shown in Fig. 3, each of the plurality of data distribution nodes **30** include a docking station **34** adapted to receive one of the plurality of hand-held computers **40**. In this first embodiment, the node data transfer mechanism **32** is a first electrical contact connector, and the hand-held data transfer mechanism **42** is a second electrical contact connector. When the hand-held computer **40** is inserted into the docking station **34**, the first electrical contact connector **32** forms an electronic connection with the second electrical contact connector **34**, thereby allowing the hand-held computer **40** to communicate with the data distribution node **30**. The benefit of the first embodiment is that large amounts of data can be transferred very quickly to the hand-held computer **40** with relatively inexpensive equipment.

[0029] In a second embodiment, as shown in Fig. 4, the hand-held data transfer mechanism **42** is a first transmitter/receiver electronically connected to the hand-held computer **40**, and the node data transfer mechanism **32** is a second transmitter/receiver electronically connected to the data distribution node **30**. The operative connection between the first and second transmitter/receivers **42** and **32** enables electronic communication between each of the plurality of hand-held computers **40** and the central computer **20** through the data distribution node **30** that is closest to the hand-held computer **40**. In the preferred embodiment, each of the plurality of data distribution nodes **30** at least periodically emits an identification signal that

alerts any of the plurality of hand-held computers **40** within range that the hand-held computer **40** is within range. In this embodiment, the hand-held computer **40** has a means to automatically transmit the request to the nearest data distribution node **30** once the hand-held computer **40** receives the identification signal. This allows the hand-held computer **40** to immediately update
5 the data itself without waiting for the user to initiate the transfer.

[0030] In another embodiment, as shown in Fig. 2, each of the plurality of hand-held computers **40** further includes a smart label **43** that reflects the identification signal to form a reflected signal that is unique to each of the hand-held computers **40**. The receipt of the reflected signal by the data distribution node **30** is reported to a report database **52** of the central
10 computer **20**. In either embodiment, it is desirable to provide the central computer **20** with a report database **52** so that the system administrators can track the buying habits of the users.

[0031] When using the first and second transmitter/receivers **42** and **32**, it is necessary to develop a system of tracking which of the plurality of hand-held computers **40** sent the data request and which of the data distribution nodes **30** received the data request. In the
15 preferred embodiment, as shown in Fig. 6, each of the hand-held computers **40** transmits an electronic request to the data distribution node **30** with a first electronic signature **90** that identifies the hand-held computer **40** that is transmitting the electronic request. The electronic request is delivered to the central computer **20** with a second electronic signature **92** that is unique to that particular data distribution node **30**. The second electronic signature **92** identifies
20 the location of the data distribution node **30** that delivered the electronic request. Once the electronic request has been processed by the central microprocessor **22**, the electronic response that has been prepared is delivered from the central computer **20** to the data distribution node **30** identified in the second electronic signature **92**. The electronic response is transmitted from the

second transmitter/receiver 32 of the data distribution node 30 and routed to the hand-held computer 40 that sent the electronic request as directed by the first electronic signature 90. The electronic response can then be stored in the hand-held data storing means 44 and displayed on the display screen.

5 [0032] Consumer Loyalty System

 [0033] As shown in Fig. 5, the invention includes a method for interacting with, exchanging data with, and rewarding a consumer. The method utilizes the data distribution network 10 described above to encourage the consumer to remain loyal to a commercial location such as a shopping mall. Each of the data distribution nodes 30 is installed in publicly accessible locations within or in proximity to the commercial location. Likely locations include entrances and kiosk locations throughout a mall or shopping center. Each of the data distribution nodes 30 is operably connected to the central computer 20, preferably with standard cables, although wireless configurations are also possible and well within the skill of those skilled in the art. Each of the plurality of hand-held computers 40 is distributed to one of the consumers. Various promotional programs can be devised by marketing professionals to either sell or give away the hand-held computers 40 to people who are likely to shop in the commercial location.

 [0034] When the consumer enters the commercial location, the hand-held data transfer mechanism 42 of the hand-held computer 40 is operatively connected with the node data transfer mechanism 32 of the closest of the plurality of data distribution nodes 30. This can be accomplished with any of the above-described methods, preferably by automatically downloading at least a portion of a commercial directory 50 through the data distribution node 30 to the hand-held data storing means 44. The commercial directory 50 includes basic

information about the commercial location such as a map of the location, which items are on sale and where the items are located. This commercial directory **50** is preferably made available to consumers so that they are able to gather data and have questions answered directly from their hand-held computer **40**.

5 [0035] In the preferred embodiment, the central computer **20** further includes a report database **52**. The data distribution network **10** automatically tracks the movement of the consumer through the commercial location, recording how much time is spent in each area of the commercial location. Those skilled in the art can devise countless methods for improving such a system, including GPS systems and triangulation between the data distribution nodes **30**. The
10 data gathered from this aspect of the system is stored in the report database **52** for later reference and use. The central computer **20** is then able to interact with the consumer based on the "memory" of the central computer **20** as to where the consumer is located within the commercial location and what he or she has been doing within the commercial location.

 [0036] In the preferred embodiment, the central computer **20** further includes a
15 consumer database **54**. The consumer database **54** stores an identity of each consumer **56** with a description of products purchased **58** by that consumer and a plurality of electronic points **60** associated with the consumer. To gather and associate the data required for this embodiment, the data input means **36** is preferably a cash register electronically connected to one of the data distribution nodes **30**. Once the consumer has selected the products he or she would like to
20 purchase, the description of products purchased **58** is inputted through the cash register into the consumer database **54**. The hand-held computer **40** is then operably connected with the data distribution node **30**, preferably through a docking station **34** as described above, so that the identity of the consumer **56** making the purchase can be transmitted to the central computer **20**

for proper association with the description of the products purchased 58. This data allows a plurality of electronic points 60 to be awarded to the consumer in proportion to the value of the products purchased. The plurality of electronic points 60 is added to any other electronic points 60 already earned and the sum is recorded in the consumer database 54. Those skilled in

5 marketing can devise multiple marketing schemes that allow the value of the accumulated electronic points 60 to be exchanged for a reward of some sort. Such a reward acts as an incentive for the consumer to accumulate the electronic points 60 by making their purchases at the commercial location.

[0037] In another embodiment of this invention, the method preferably further

10 includes a coupon database 62 containing a plurality of coupons 64. When the hand-held computer 40 transmits the data request, the central computer 20 locates the identity of the consumer, references the description of products purchased 58 associated with that consumer, and compares the description of products purchased 58 with a plurality of coupons 64 available in the coupon database 62. The plurality of coupons 64 that are determined to be similar to the

15 description of products purchased 58 are then offered to the consumer as an incentive to purchase additional goods at the commercial location. In an alternative embodiment, the central computer 20 transmits a random sampling of some of the plurality of coupons 64 available in the coupon database 62 without restricting the coupon availability to those that are somehow related to the user.

20 [0038] Another important aspect of this invention is that the combination of the above-described features allows even further innovation. For instance, the central computer 20 can "learn" about the buying habits of the consumer based on the report database 52 and the consumer database 54, marketing efforts such as special coupons from the coupon database 62

can be directly targeted to the consumer. Those skilled in the marketing profession can devise many special programs to be used within the framework of this invention without deviating from the inventive spirit of the invention described herein.

[0039] Flight Data System

5 [0040] As shown in Fig. 7, the invention also includes a method for distributing flight data to a traveler. While we refer specifically to flight data for airlines, it should be understood by those skilled in the art that the system is equally useful for a variety of forms of transportation, including busses, ferries, trains, boats, etc.. These alternative embodiments are expressly considered equivalent to the embodiment described herein. In this embodiment, the
10 central data storing means **24** is programmed to store a flight database **70** and a traveler database **77**. The flight database **70** contains a plurality of aircraft arrival places and times **72** and a plurality of aircraft departure places and times **74**. In its preferred embodiment, the flight database **70** also includes a plurality of baggage claim sites **76**.

 [0041] The traveler database **77** containing a plurality of identities of travelers **78**.
15 Those skilled in the art will recognize that the consumer database **54** can function as the traveler database **77**. When a ticket is prepared for the traveler, the airplane ticket is associated with one of the plurality of aircraft departure places and times **74**, one of the plurality of aircraft arrival places and times **72**, and one of the baggage claim sites **76**. The identity of the traveler **78** is inputted into the flight database **70** and associated with the aircraft departure time and place **72**,
20 the aircraft arrival time and place **74**, and the baggage claim site **76** associated with the ticket purchased by the traveler. The data distribution nodes **30** are preferably installed in publicly accessible locations within an airport, thereby allowing the traveler to access the flight database

70 on a regular basis to review the current aircraft departure time and place 72, the current aircraft arrival time and place 74, and the baggage claim site 76.

[0042] In the most preferred embodiment, the hand-held computer 40 automatically signals the central computer 20 when the traveler enters the airport. The central computer 20 can then compare the identity of the traveler 78 with the associated flight arrival places and times 74 and the flight departure places and times 72 and alert the traveler if there have been any changes to the associated flight arrival places and times 74 and the flight departure places and times 72. In this embodiment, the hand-held computer 40 further includes a means of warning the traveler 79, such as a speaker that emits an audible tone if there has been a change in his or her schedule. In an alternative embodiment, the central computer 20 advises the airline reservation and ground services department of the arrival of a passenger and permit the people to contact the passenger through the central computer 20 via the hand-held computer 40. There are many specific uses that can be devised for this system by those skilled in the art, and obvious variations of the above described system are considered equivalent to the best mode described herein.

[0043] Electronic Concierge System

[0044] As shown in Fig. 8, the invention further includes a method for providing an electronic concierge service to at least one hotel guest. In this embodiment, the central computer 20 is programmed with an entertainment database 80. When a hotel guest is checked into the hotel, he or she is provided with the hand-held computer 40 described above. At least one data distribution node 30 is installed in the hotel for updating the hand-held computer 40 as described above. An employee is then responsible for inputting into the entertainment database

80, on a regular basis, entertainment information of interest to the hotel guest. The entertainment database 80 preferably includes a list of restaurants, shops, shows, concerts, conventions, special events, historic sites or other sites of interest to tourists. The entertainment database 80 preferably includes information about prices, menus, special discounts and other specialty information. In the preferred embodiment, the central computer 20 can also facilitate the purchase of tickets to the various events, preferably at discounted rates. The discounted rates can be provided by either taking advantage of commercially available coupons or special engagements, or the hotel can negotiate special rates for its guests.

[0045] In the preferred embodiment, the central computer 20 of this embodiment further includes the consumer database 54 described above. The consumer database 54 allows the system to track users and customize data to suit the needs of the individual consumer, as well as return valuable marketing data about the consumer. As noted above, those skilled in the art can devise countless marketing programs around the novel capabilities of this system.

[0046] Travel Agency Data Distribution System

[0047] In its more complex embodiment, the invention can include many of the above-described embodiment and administered by a travel agency or similar company to provide a traveler with a great deal of information throughout his or her travels. Such an embodiment would preferably include, at a minimum, a traveler database 77, a flight database 70, and an entertainment database 80 as previously described. The data distribution network 10 preferably further includes news, alerts, and other data information of interest to travelers, especially those traveling to other countries. One particular benefit of having a travel agency manage the data distribution network 10 is that they would have the economic clout to negotiate special deals

throughout the world and allows the traveler to purchase many tickets before traveling and with U.S. dollars, thereby avoiding difficulties in changing money.

[0048] All of the data can be centrally managed and updated for real-time or near real-time distribution to thousands of travelers. By bringing the data under central and professional management, the individual traveler can receive all of the benefits of a major travel agent in real time and at his or her fingertips. Furthermore, it is expected that the several embodiments will be compatible so that the hand-held computer 40 of one embodiment may respond to the signals of different central computers 20.

[0049] All of the above embodiments include advertising indicia printed or otherwise marked on the hand-held computer 40 or generated by the display of the hand-held computer 40. The advertising indicia are sold to relevant sponsors; and the money generated by the sale either defrays or entirely eliminates the cost of manufacturing the hand-held computer 40.

[0050] While the invention has been described with reference to at least one preferred embodiment, it is to be clearly understood by those skilled in the art that the invention is not limited thereto. Rather, the scope of the invention is to be interpreted only in conjunction with the appended claims.